

NASA Anthropometry and Biomechanics Facility Human Modeling

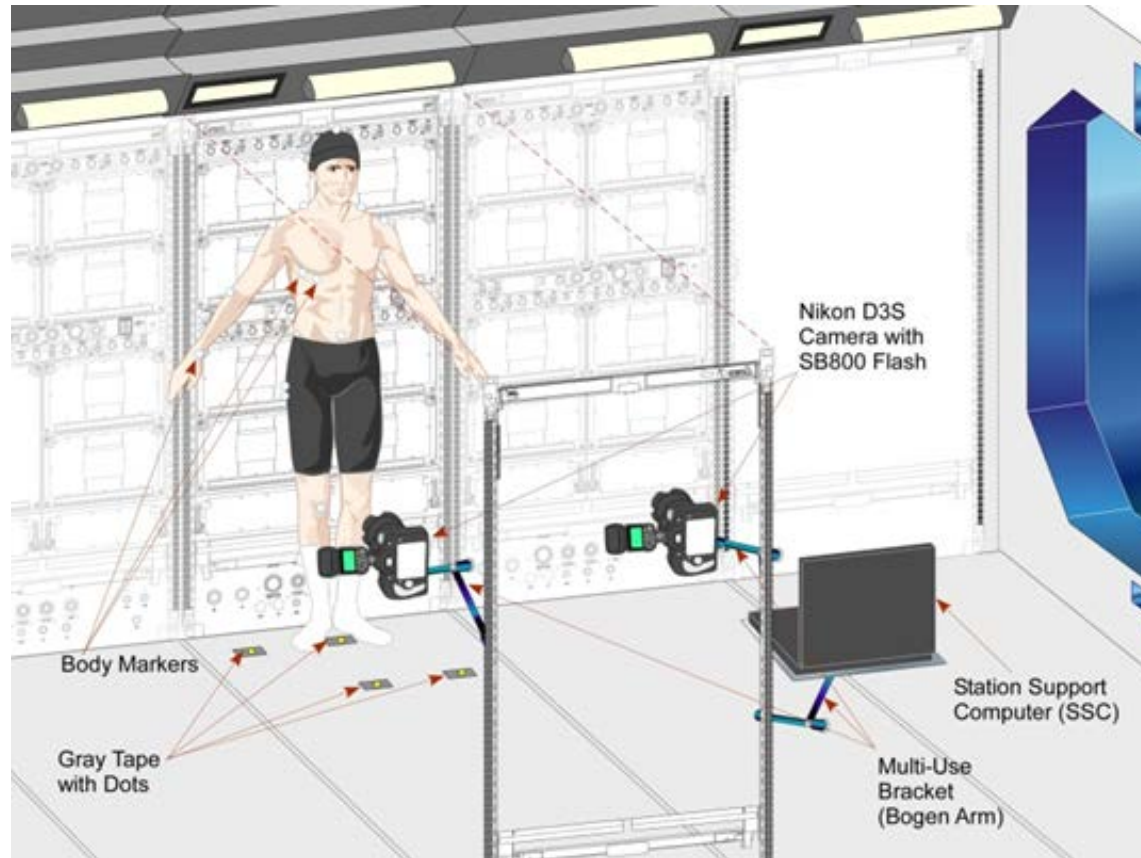
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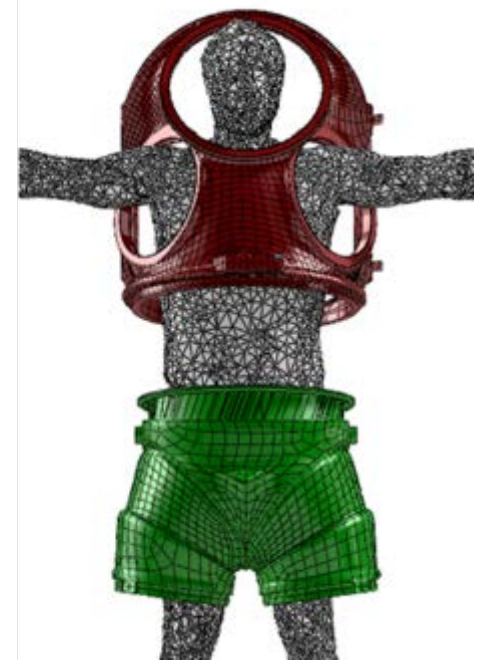
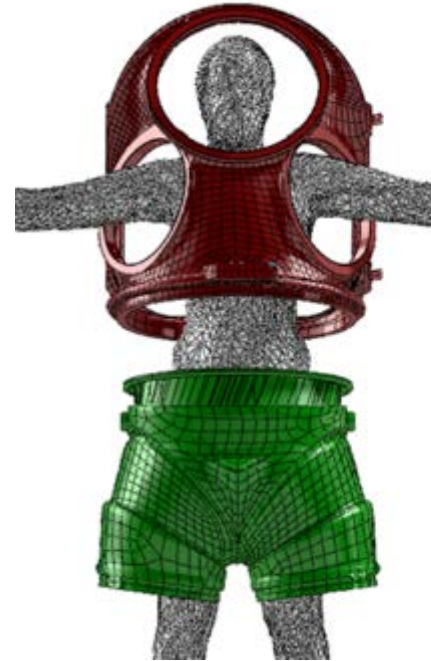
Population Size Variation

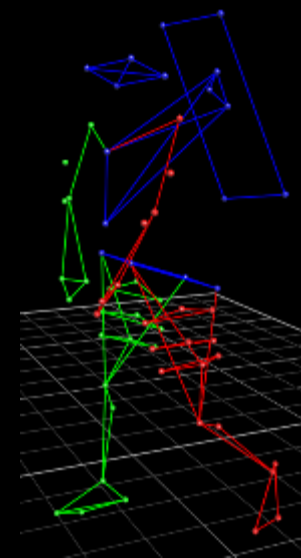
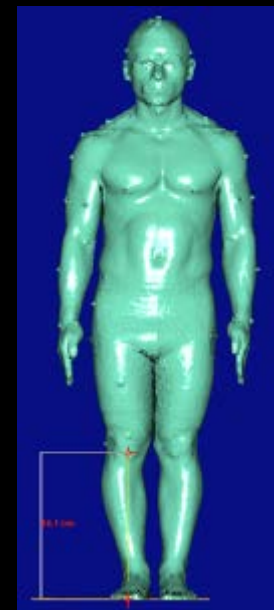
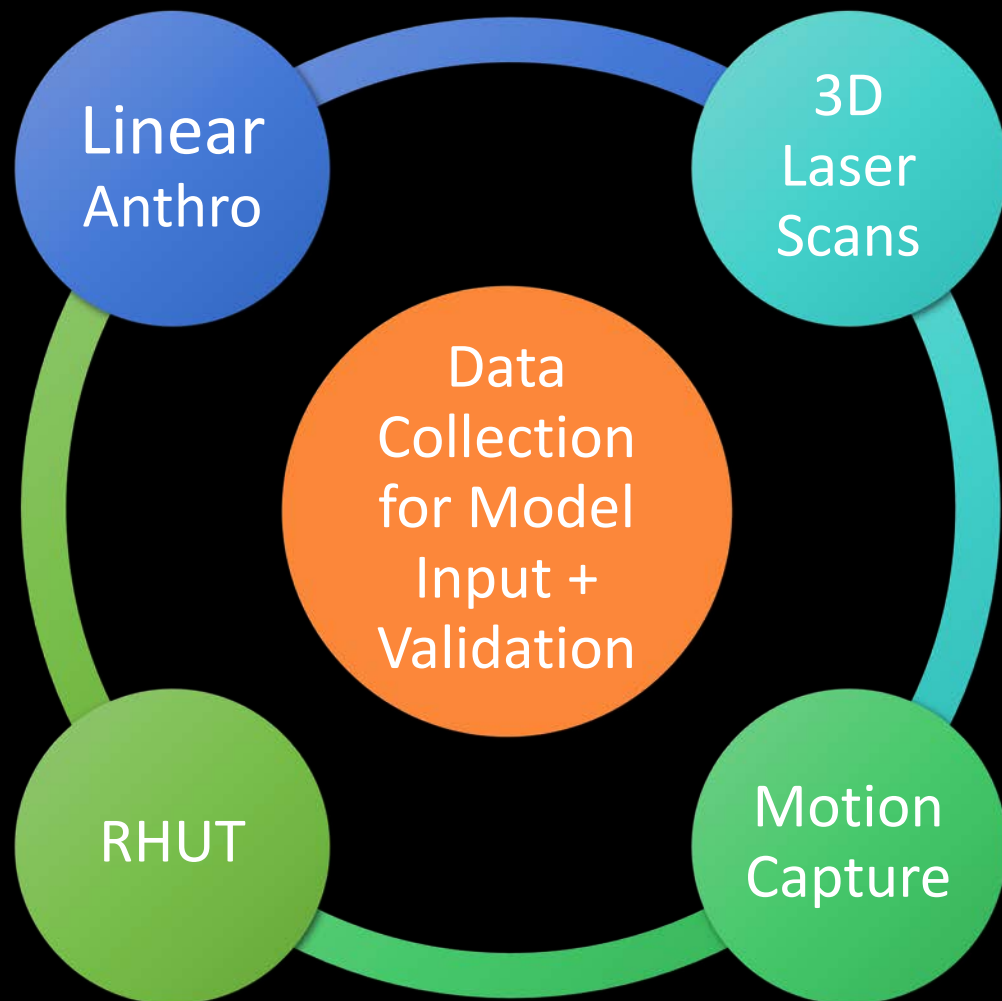
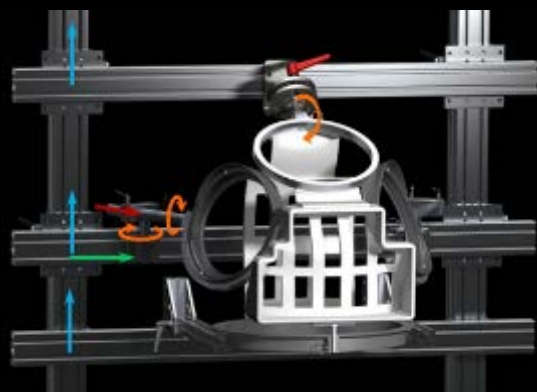
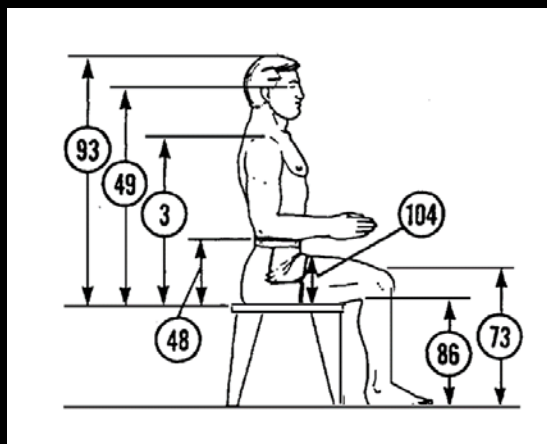


In-flight Anthropometry and Posture Changes

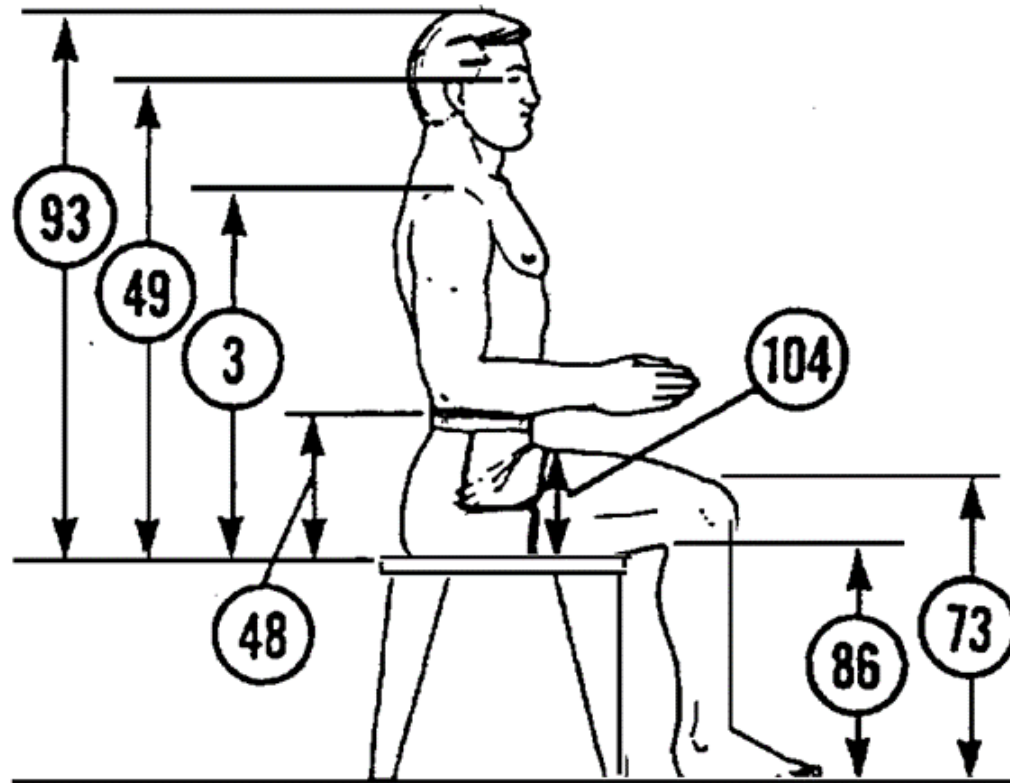


Accommodation Challenges

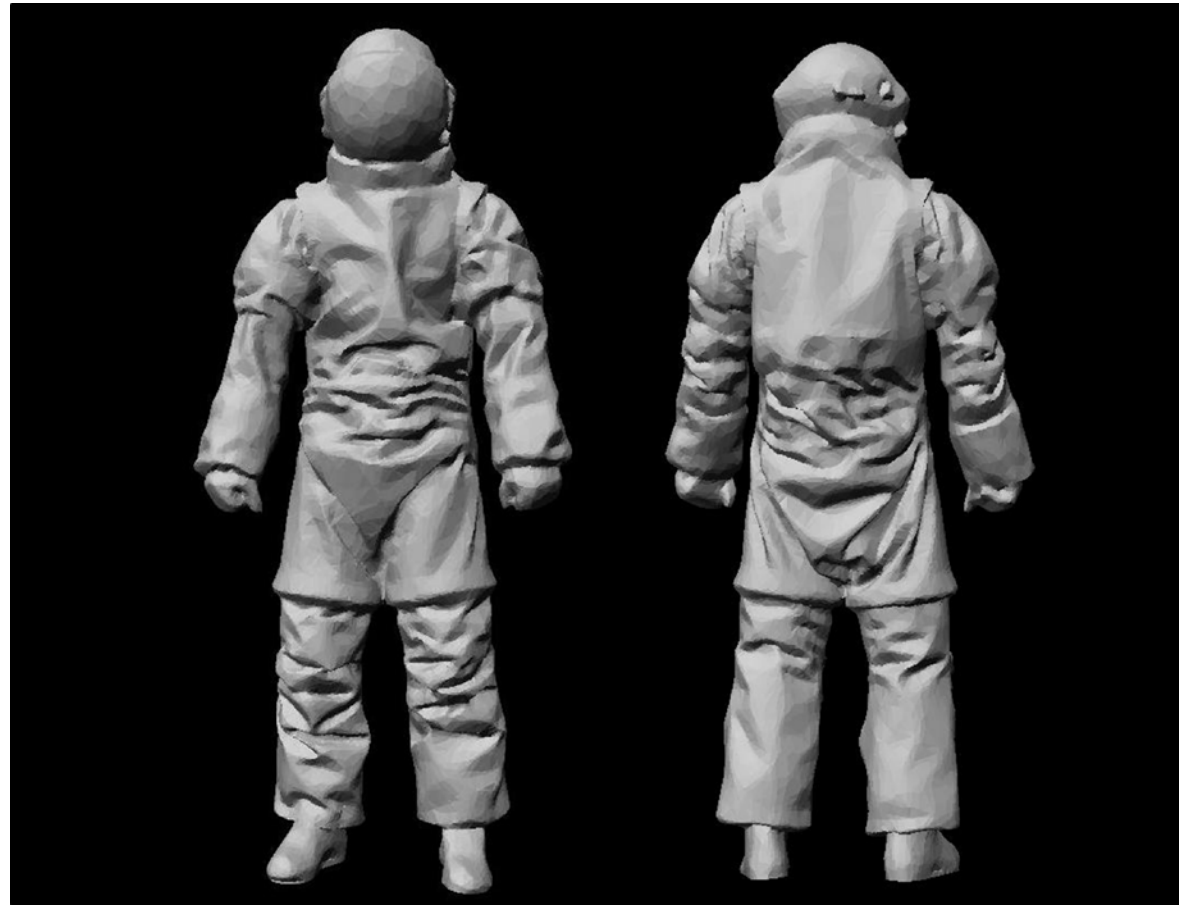




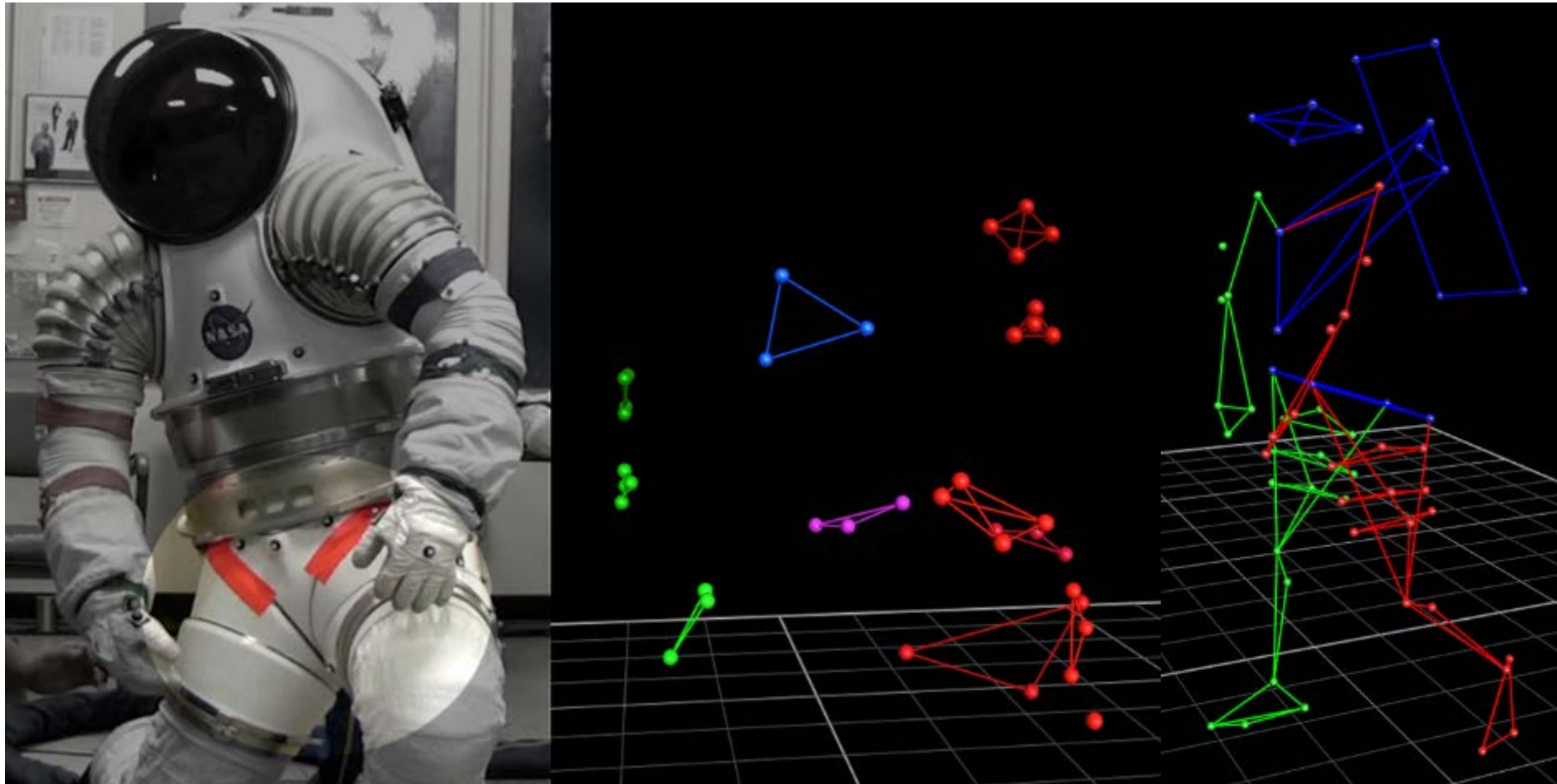
Linear Anthropometric Measurements



Full Body Laser Scans



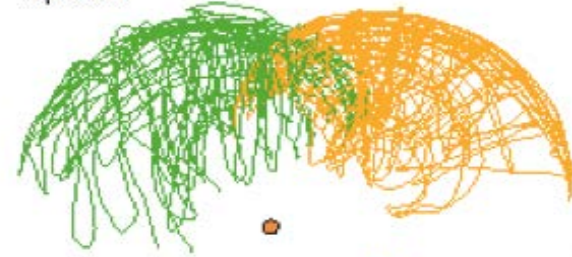
Motion Capture



Underwater Motion Capture



Top View



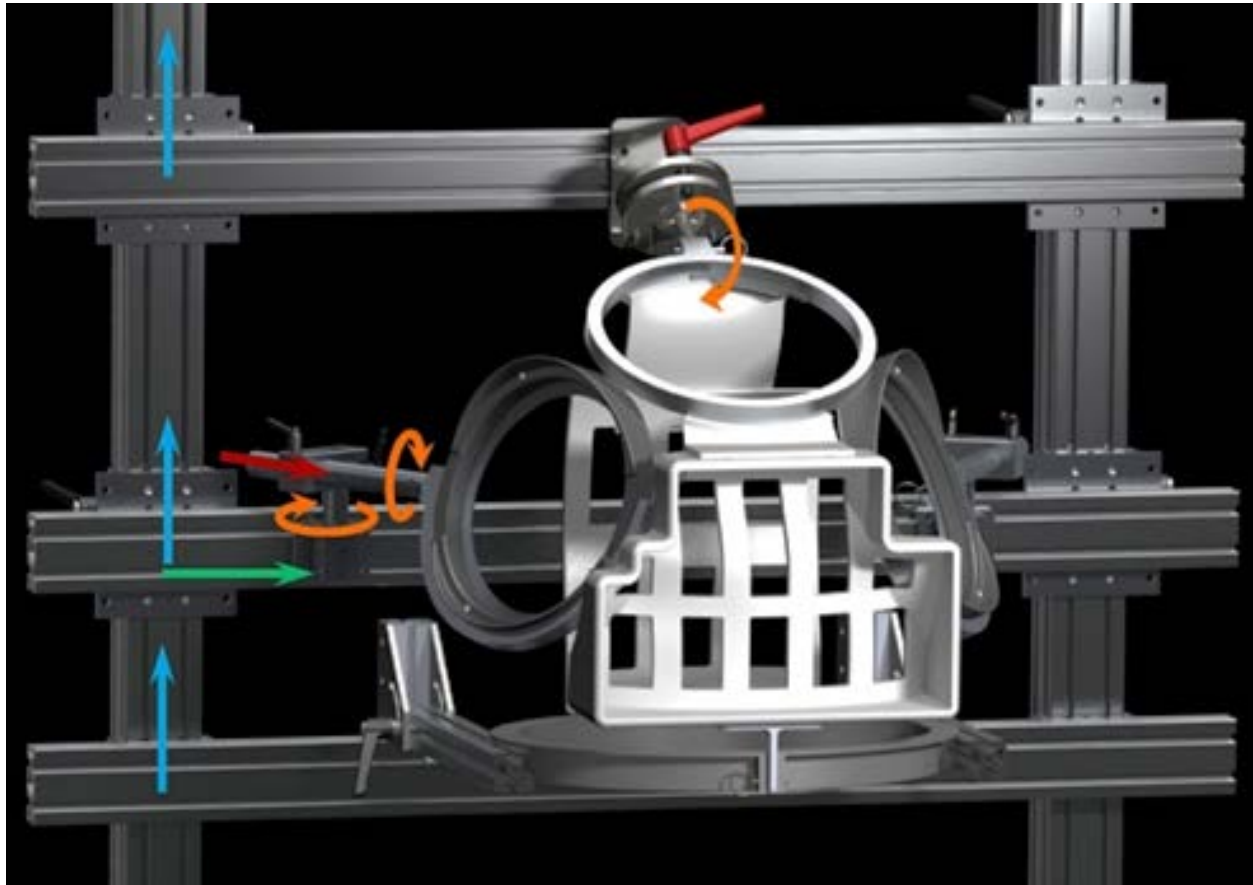
Rear View

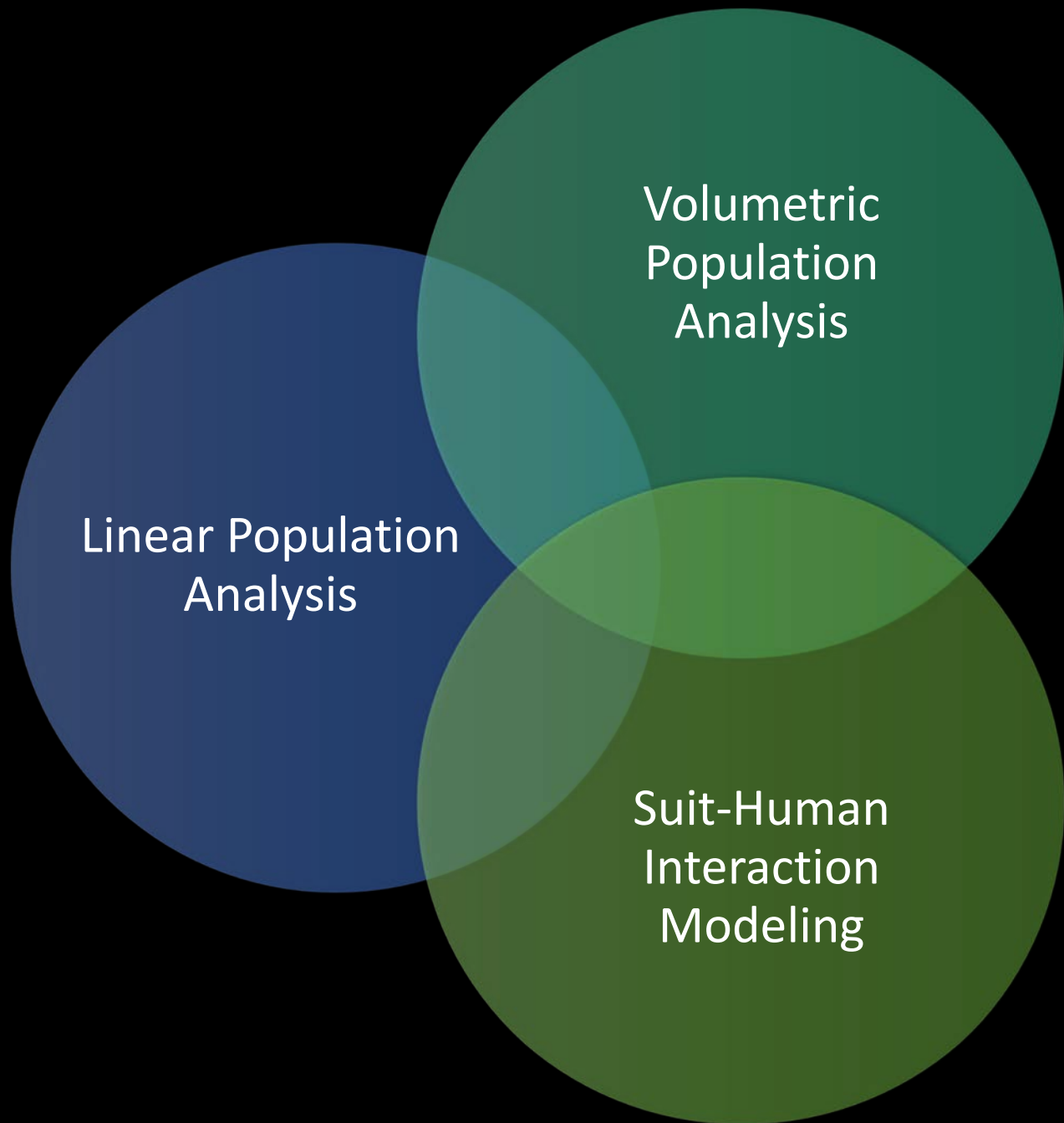


Side View

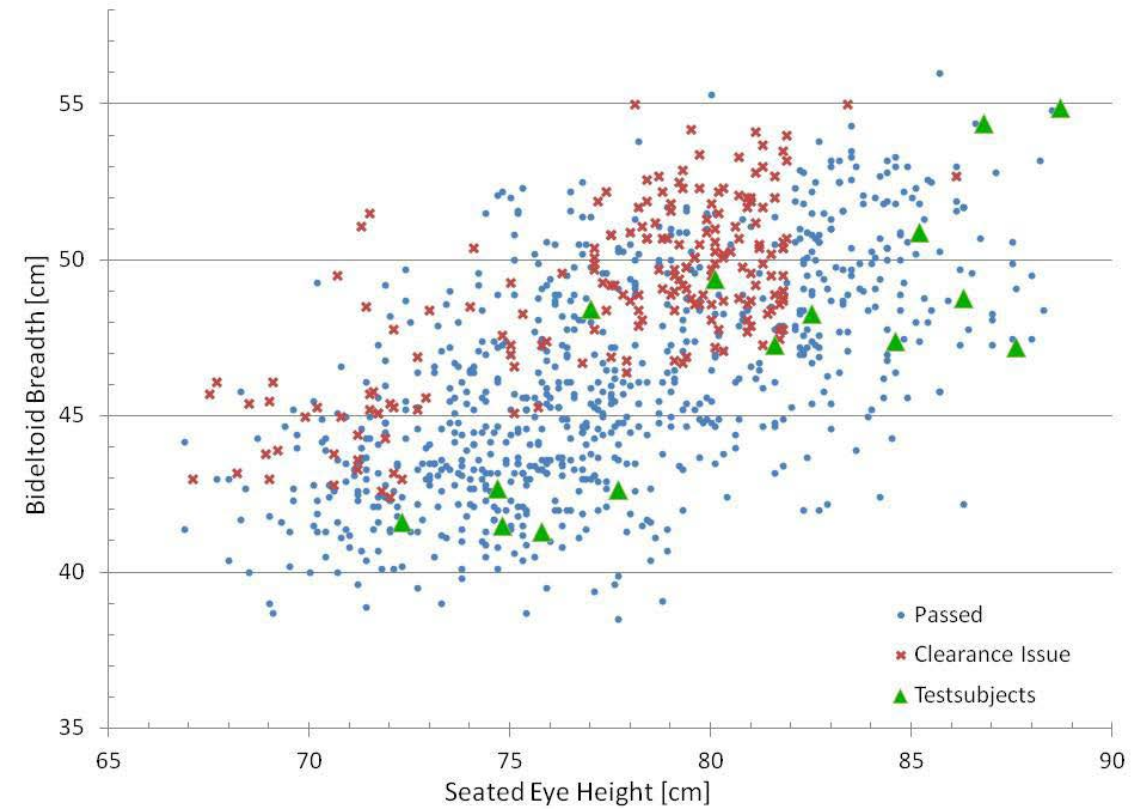
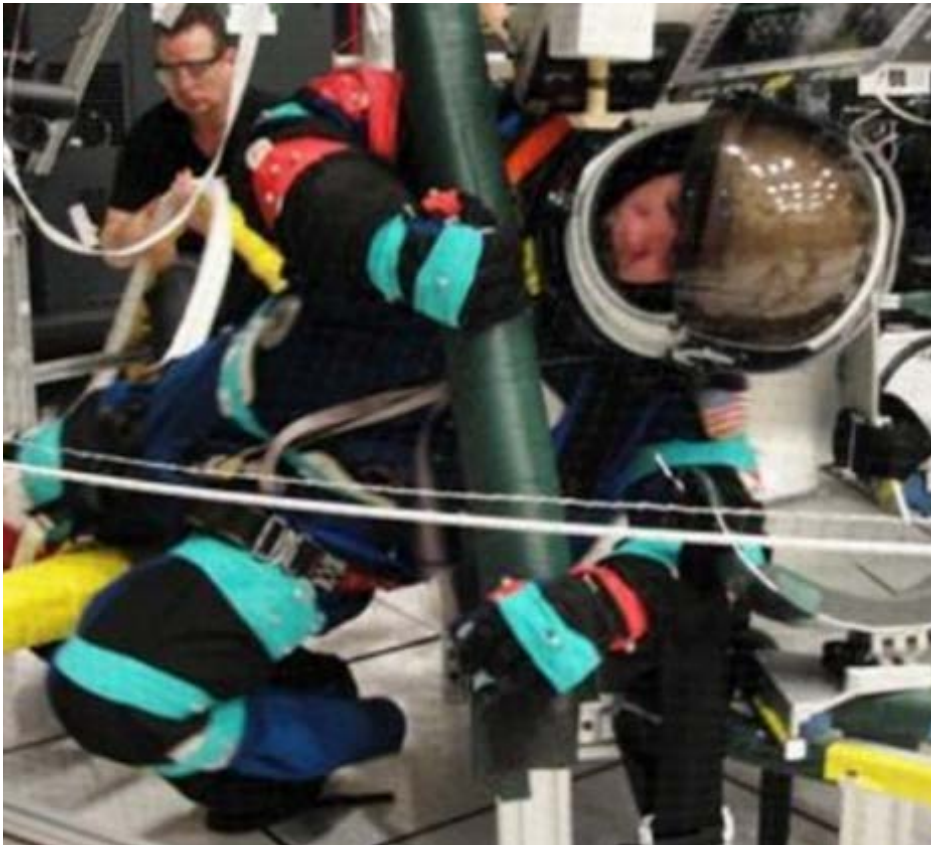


Reconfigurable Hard Upper Torso

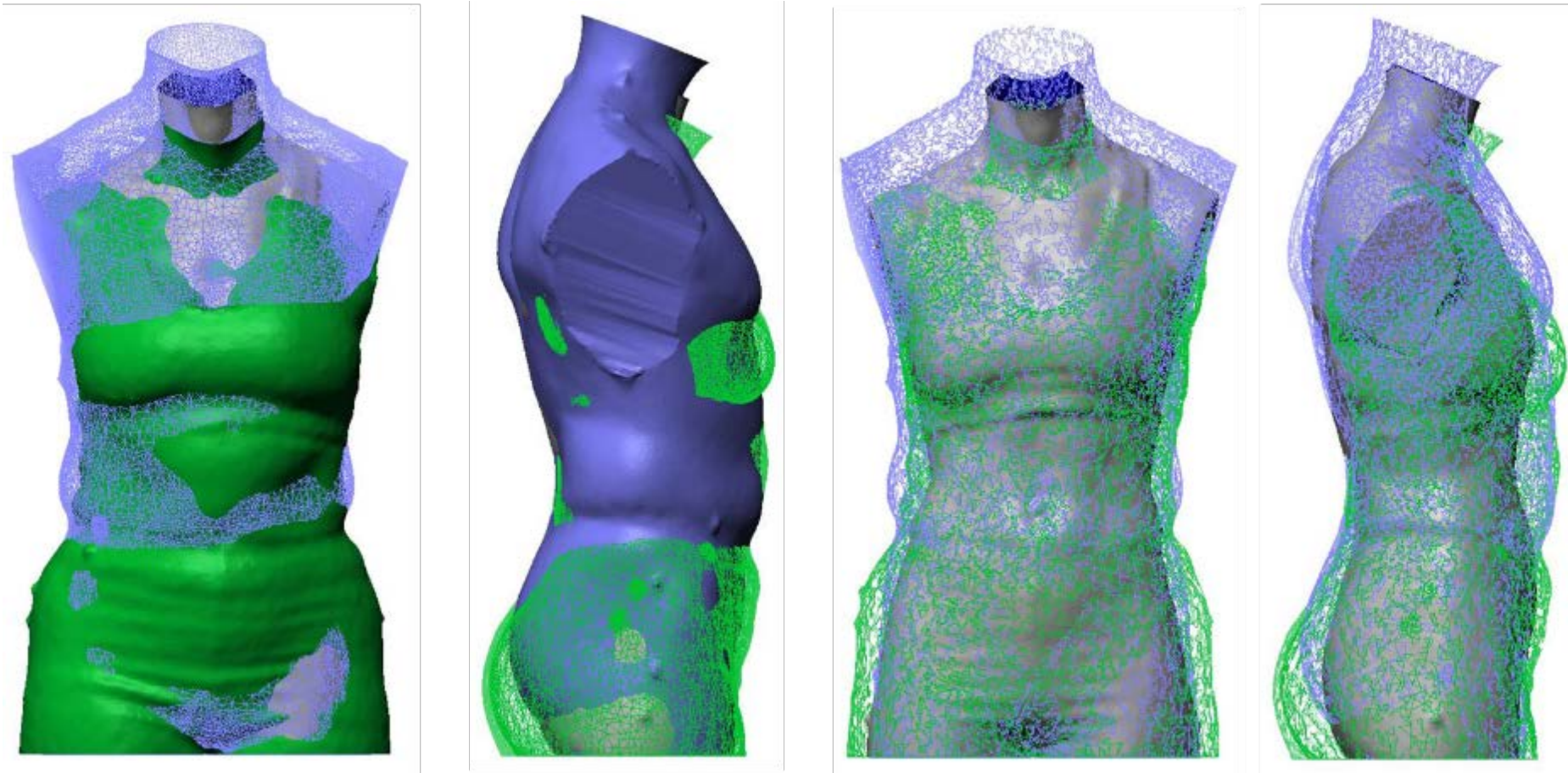




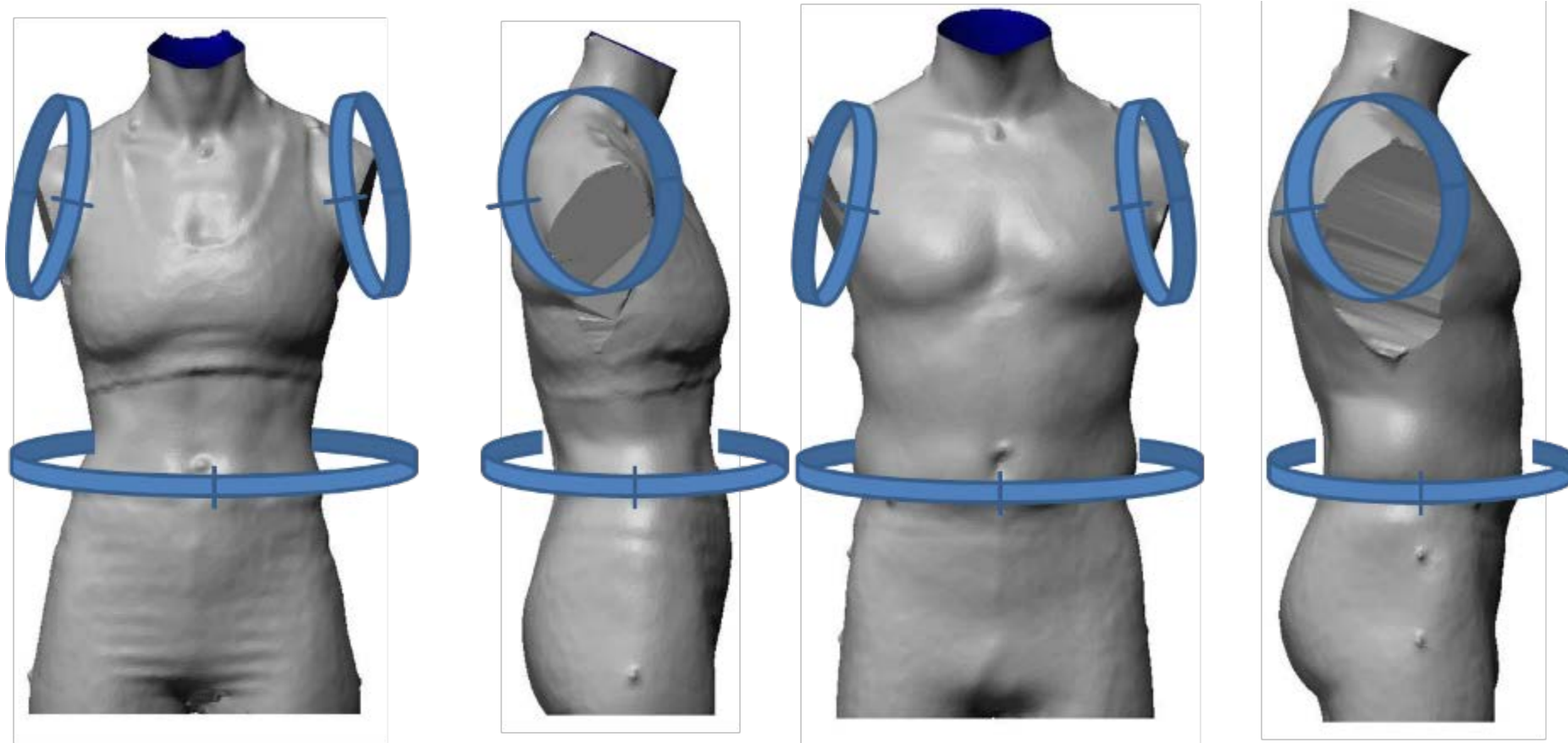
Population Analysis – Linear Anthropometry

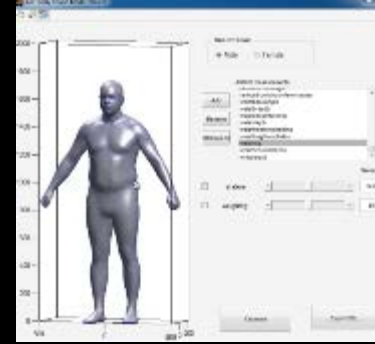


Population Analysis - Volumetric

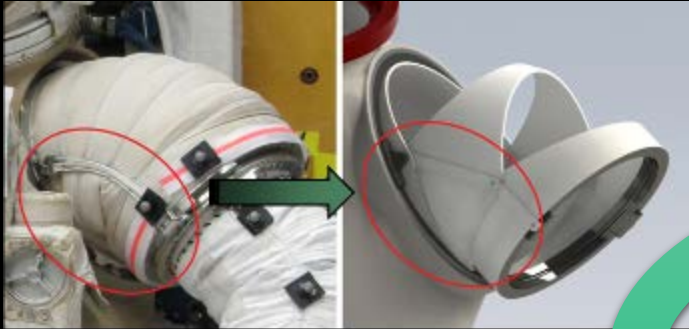


EMU Scye Bearings Overlay

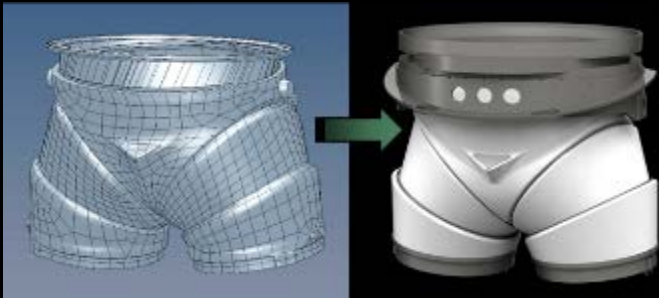




Parametric Human
Body Models



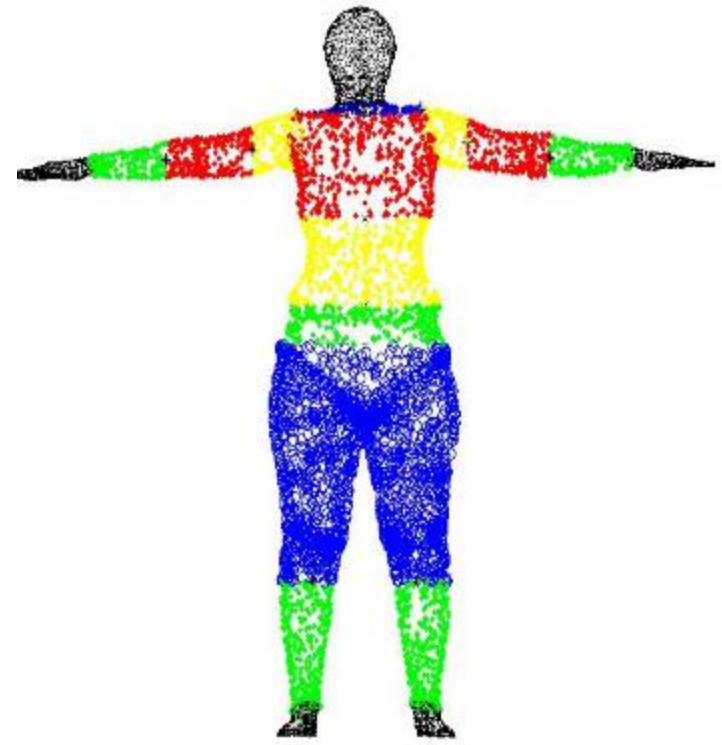
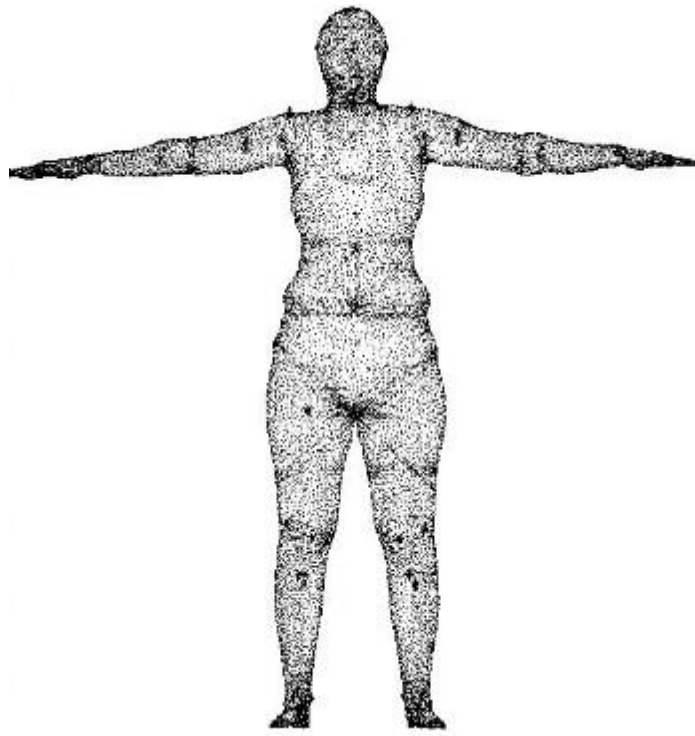
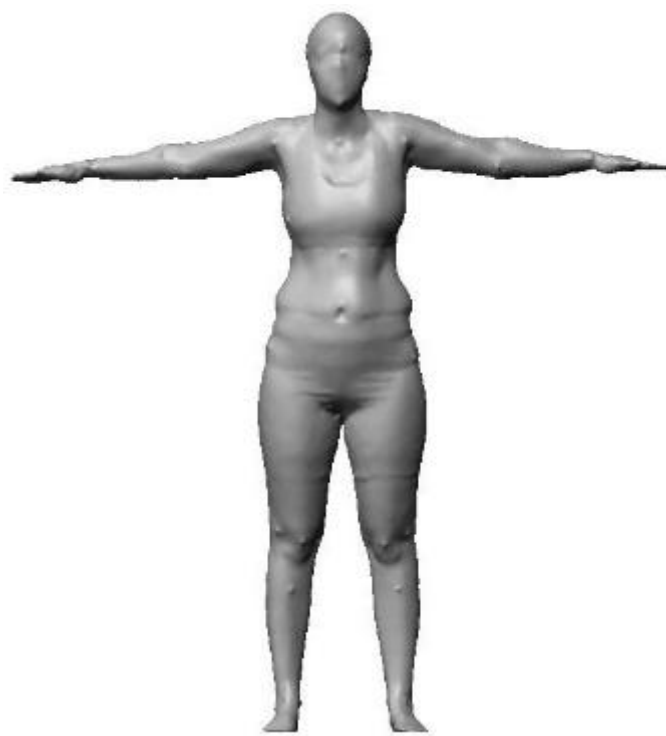
Suit CAD
Models



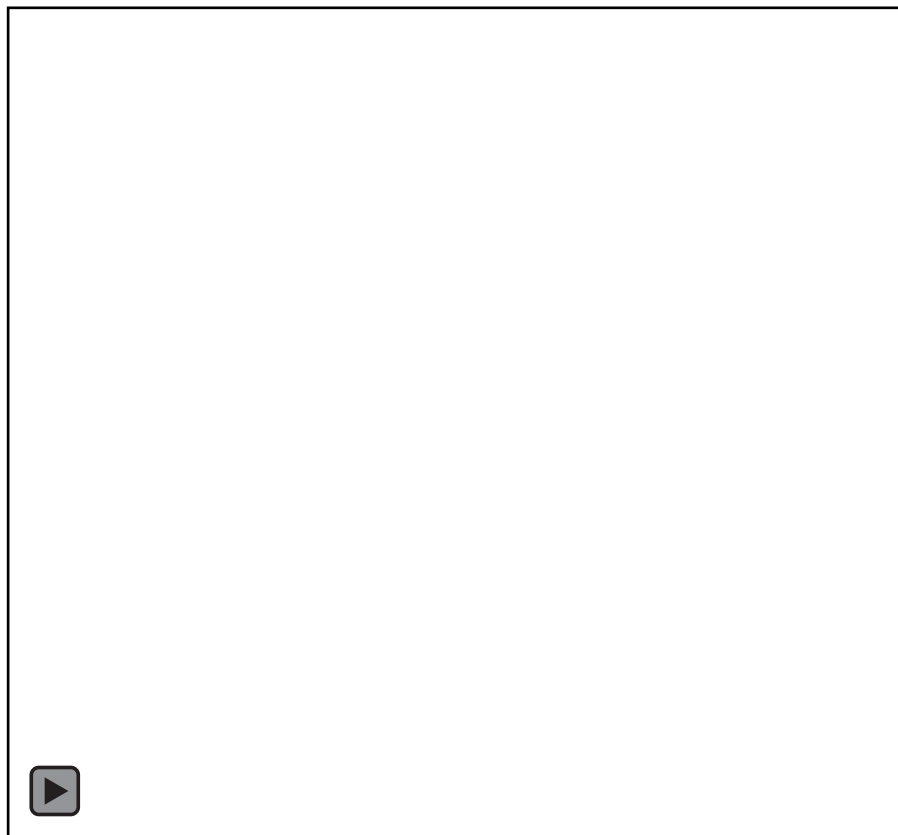
Integrated Suit-
Human Models



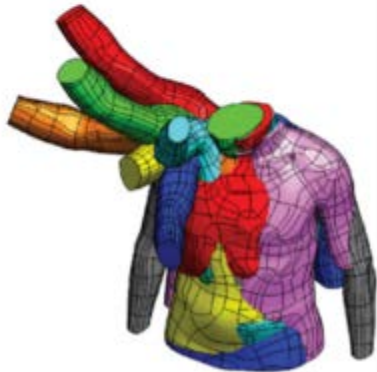
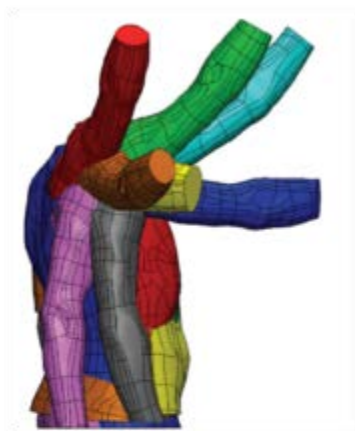
Boundary Manikins



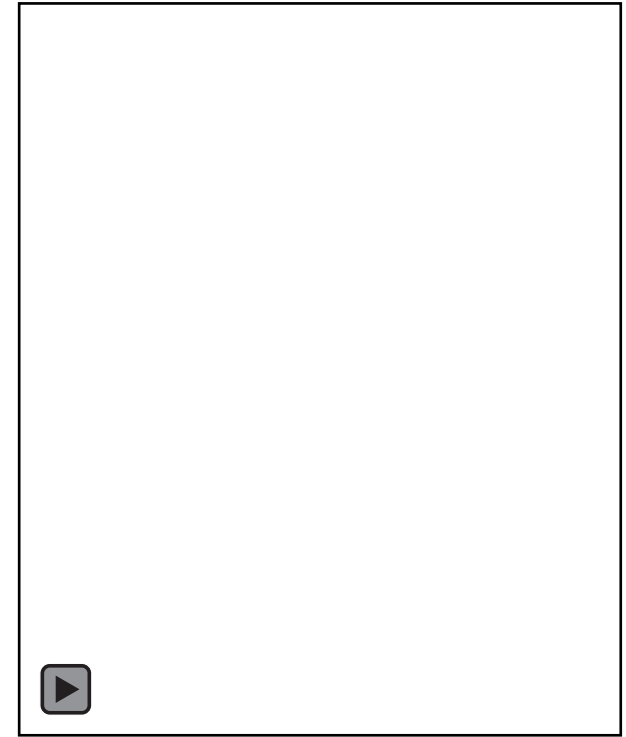
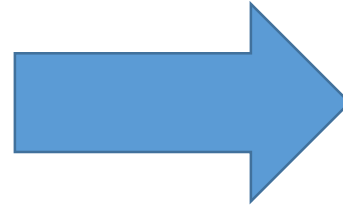
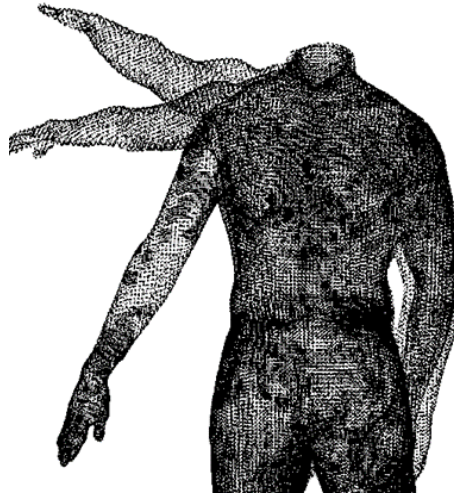
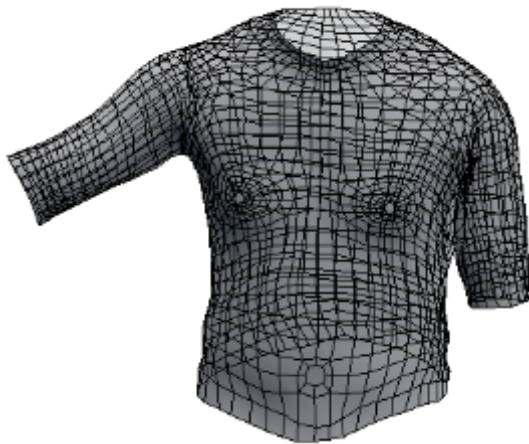
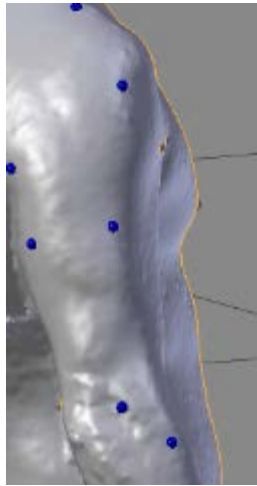
ABF Body Shape Model Toolkit



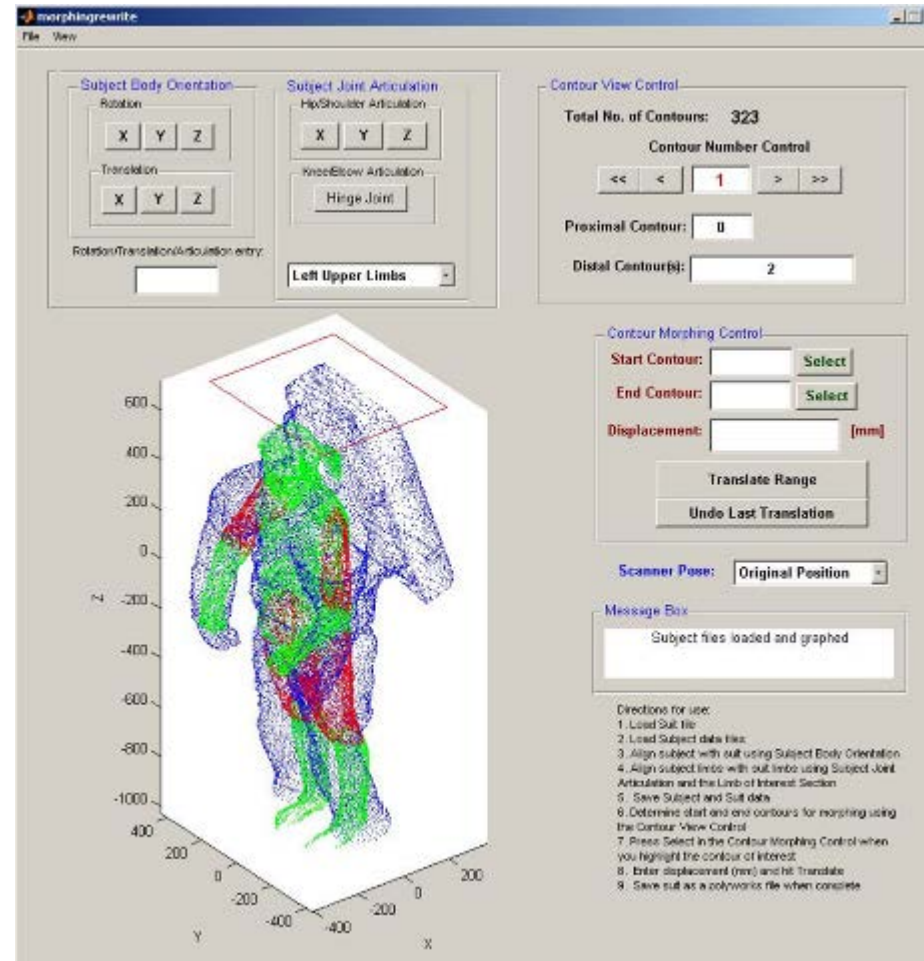
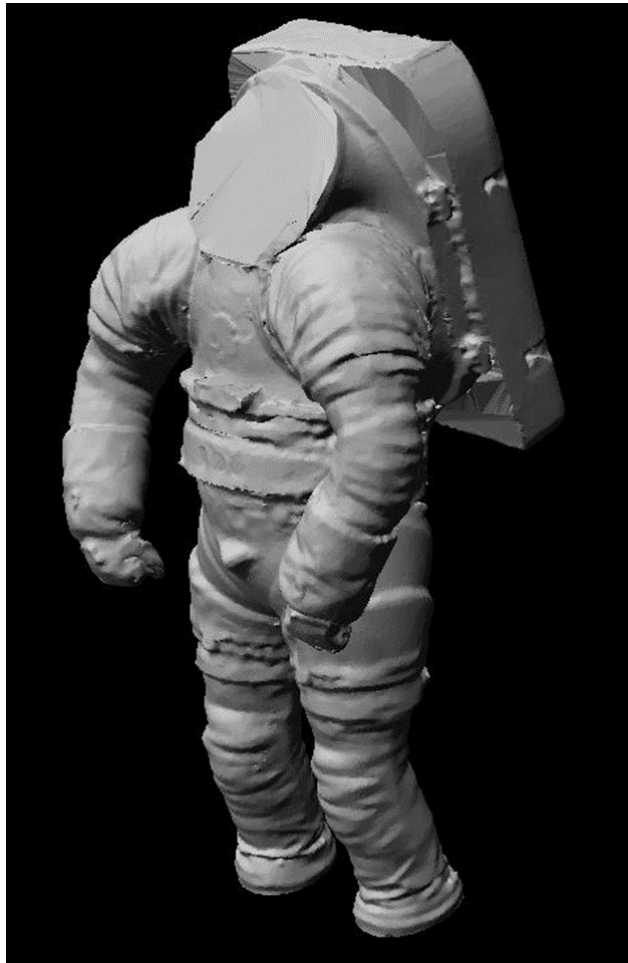
Static Shoulder Deformation Model



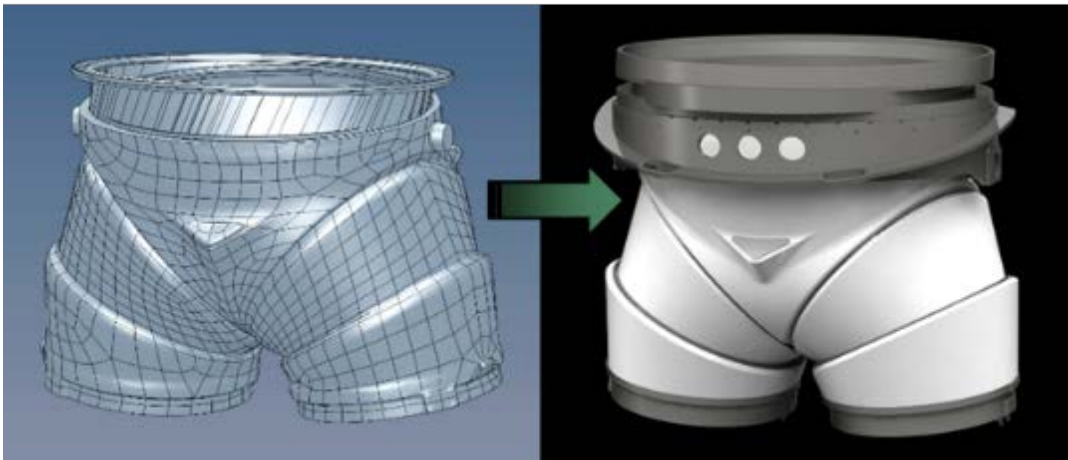
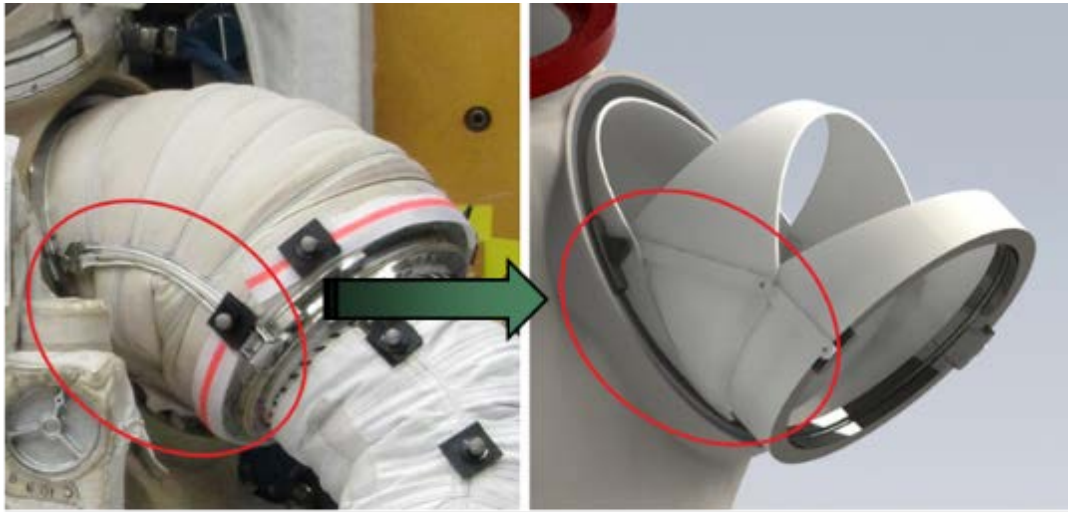
Parametric Shoulder Articulation Model



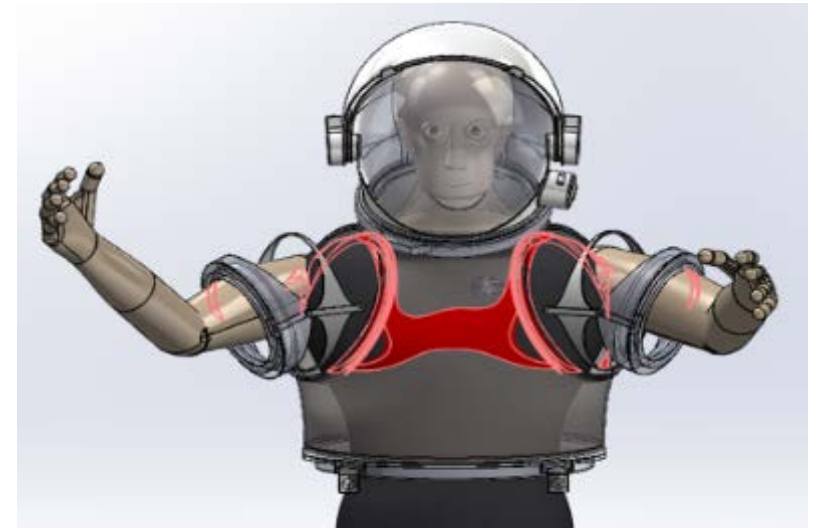
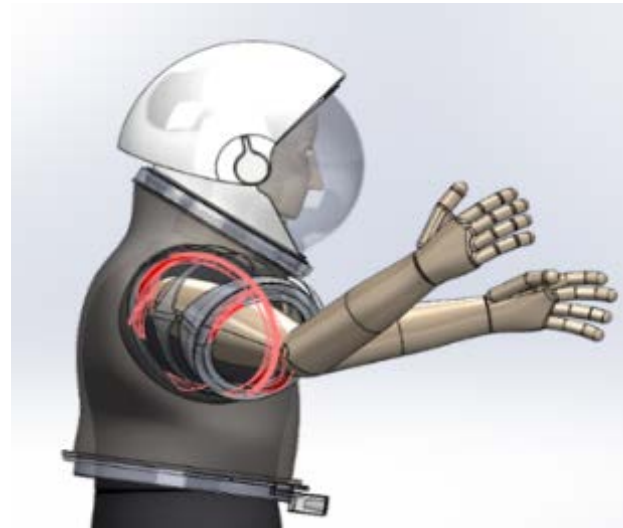
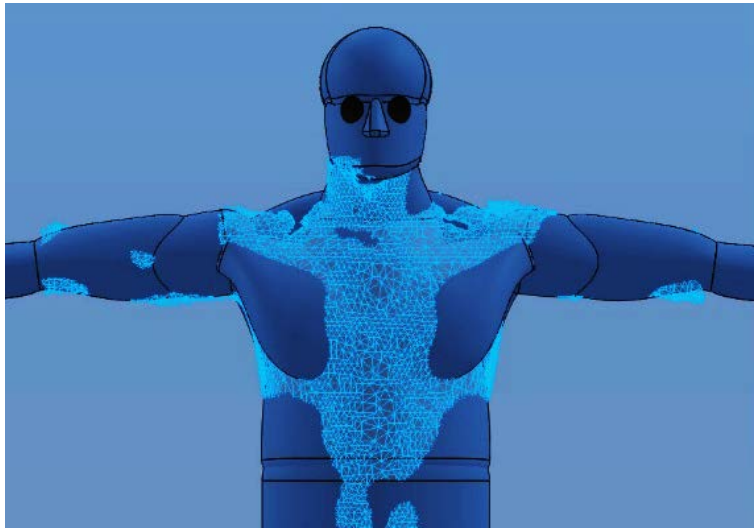
Morphing MK III and Subject Scans



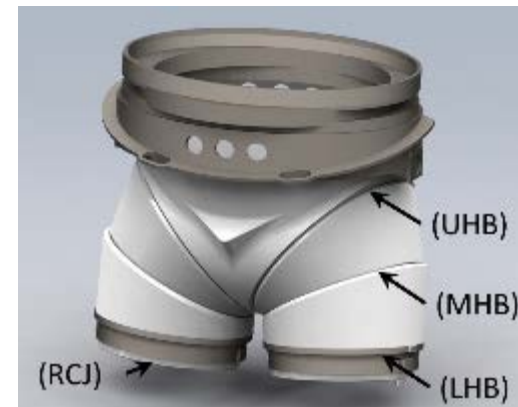
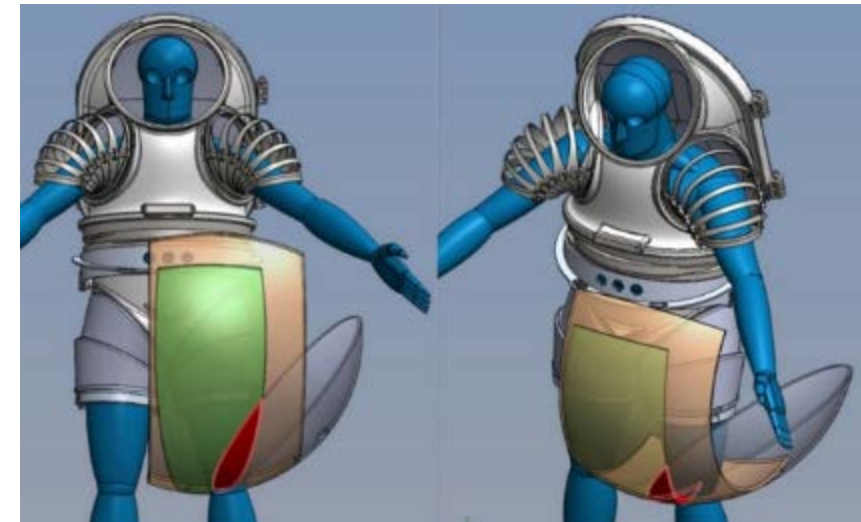
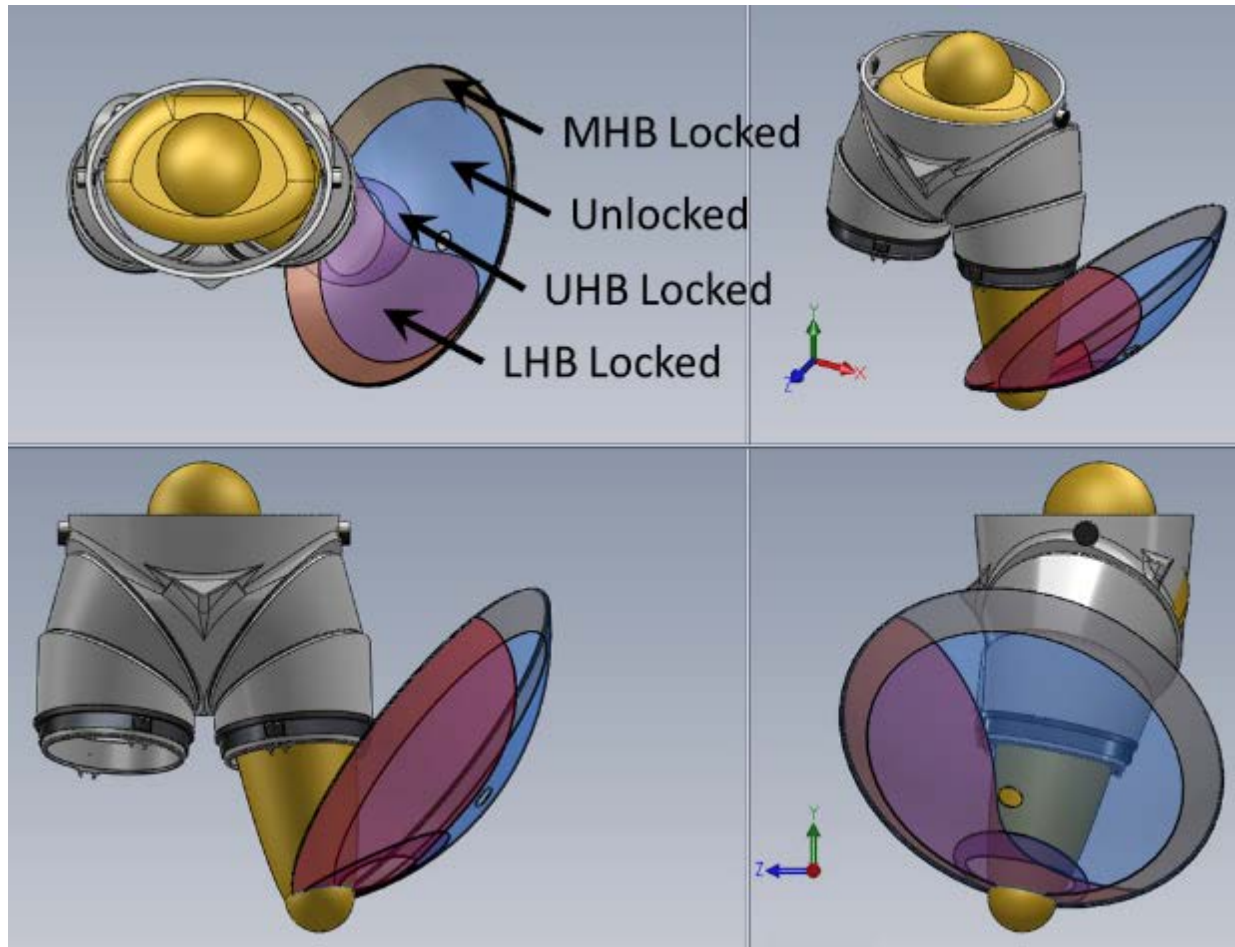
SUIT CAD MODELS



Articulated CAD Model of Human

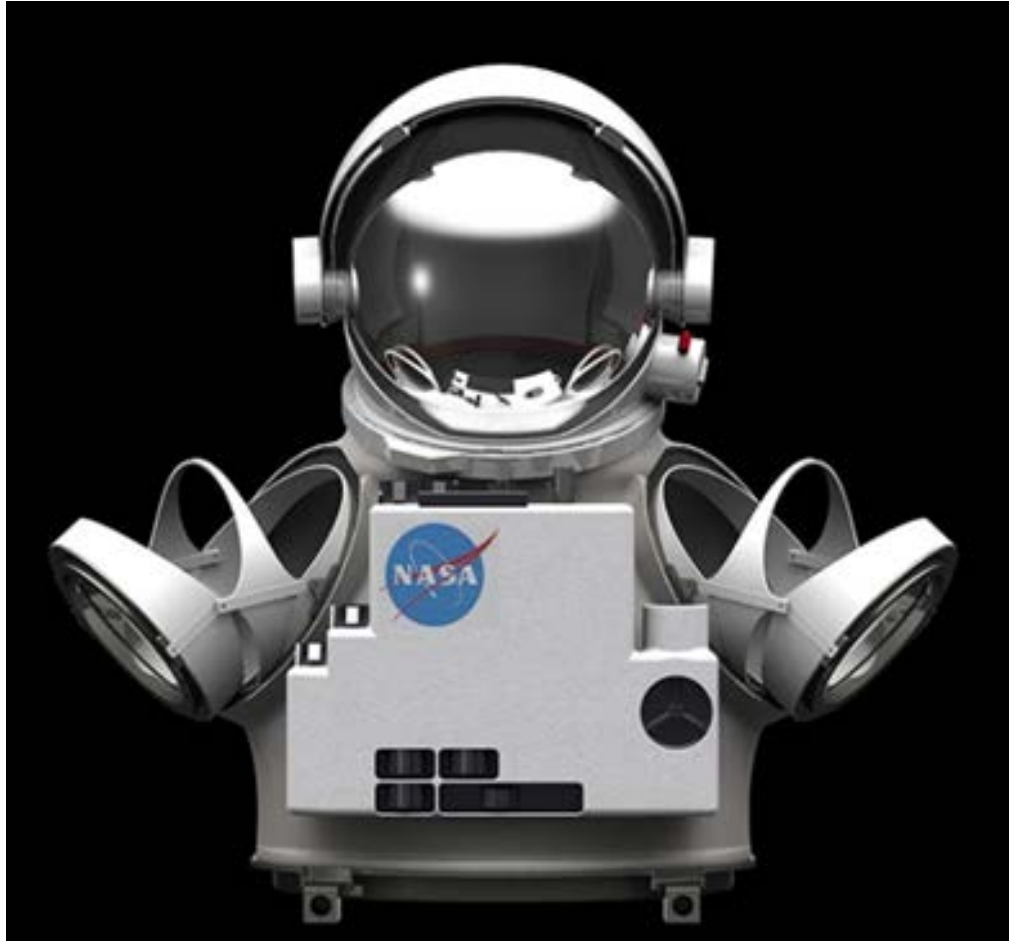
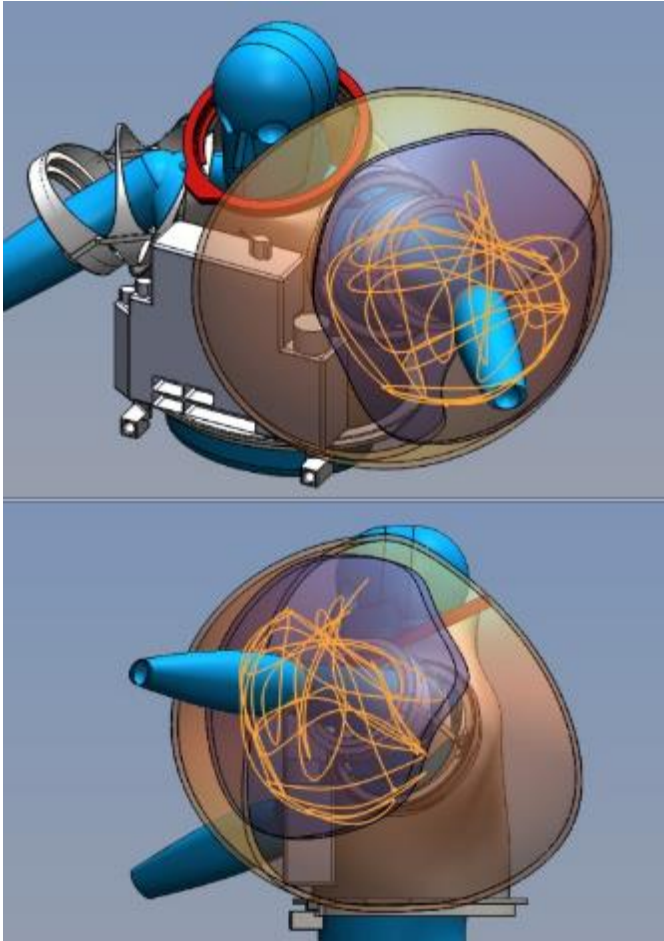


Work Envelope Estimation – Lower Body

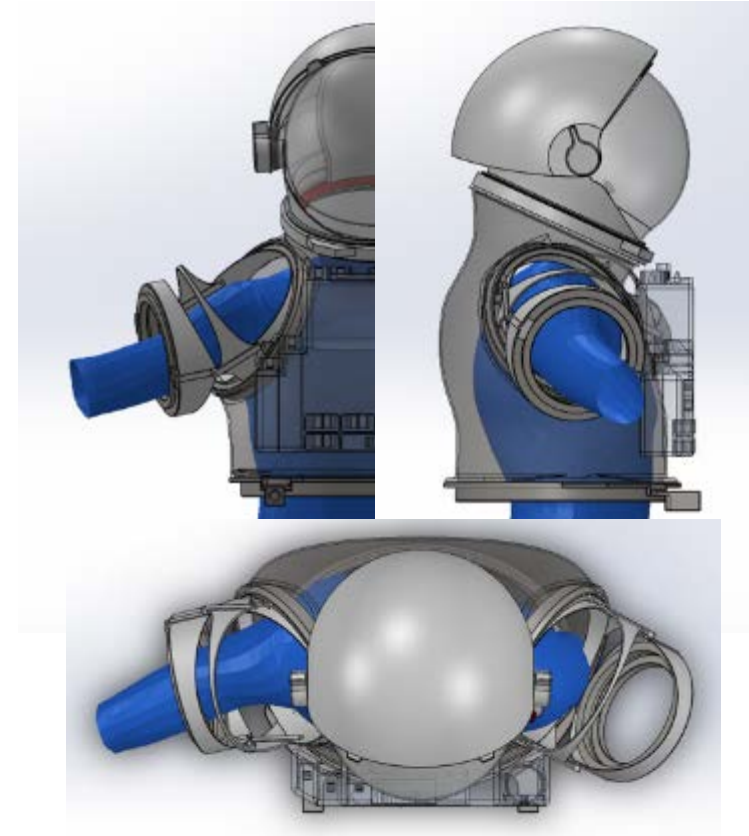
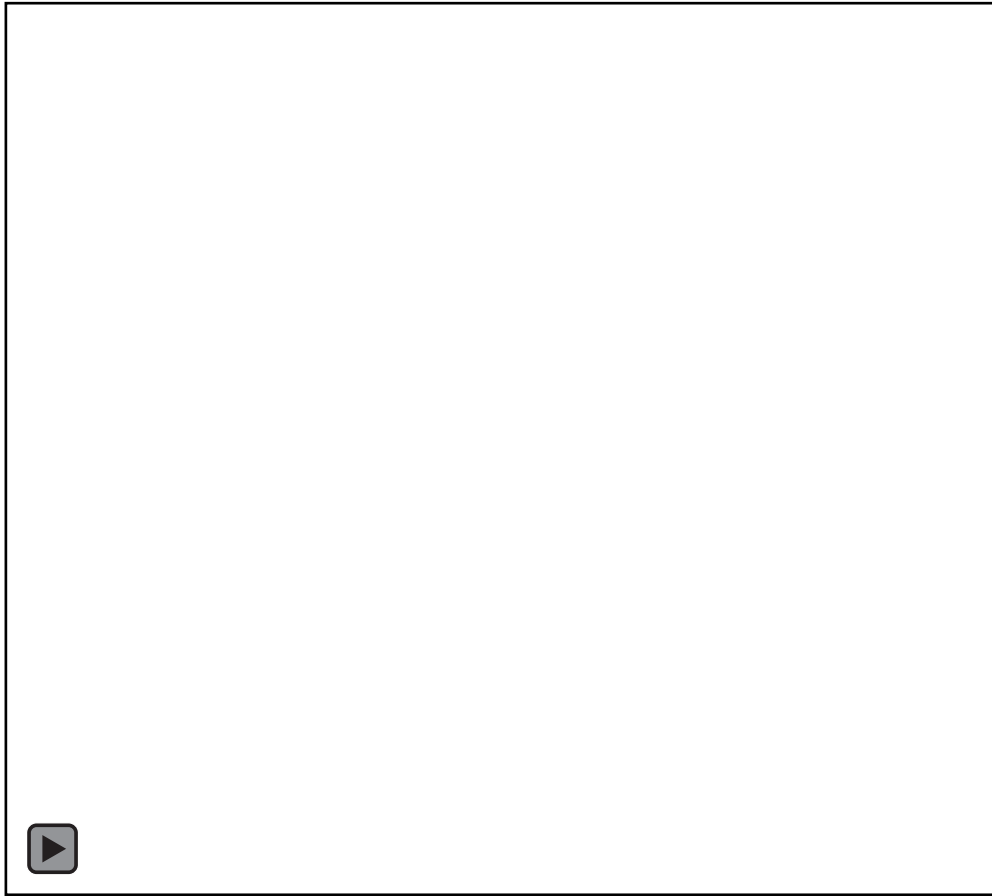


UHB: Upper Hip Bearing
MHB: Middle Hip Bearing
LHB: Lower Hip Bearing
RCJ: Rolling Convolute Joint

Work Envelope Estimation – Upper Body



Virtual Fit Assessment



Future Work/Improvements

- PROTEUS - Improvements to Virtual Fit Model
- Fleet Sizing – Future suit sizing schemes
- Implementation – Development of tools for user community

